Page 26, line 20, change "imbedded" to --embedded--.

Page 26, line 24, change "vise" to --vice--.

Page 27, line 2, change "column" to --structure--.

Page 27, line 15, change "magnetic" to --non-magnetic--.

Page 28, line 9, change "6" to --8--.

Page 29, line 10, change "embodiment" to --embodiments--.

Page 29, line 11, change "is" to --are--.

In the Claims

Amend the following claims:

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1. (Amended) A head for use in a magnetic recording system including a magnetic media with perpendicular magnetic polarity transitions written thereon and circuitry adapted to receive a readback pulse with a substantially Lorentzian pulse shape from said head, said head for transferring data between the magnetic media and an exterior environment, said head comprising:

a write element for inducing said perpendicular magnetic polarity transitions into a surface of said magnetic media during a write operation; [and]

a yoke disposed within said write element, said yoke having a read gap for sensing said perpendicular magnetic polarity transitions; and

a magnetoresistive read element mounted in a flux flow path of said yoke, wherein said magnetoresistive read element produces a readback pulse having a substantially Lorentzian pulse shape in response to one of said perpendicular magnetic polarity transitions.

The magnetic recording system

2. (Amended) ~~The head~~, as claimed in Claim 1, wherein said flux flow path includes a read flux flow path integral with a write flux flow path [further comprising:

a magnetoresistive element mounted in a flux flow path of said yoke].

The magnetic recording system

3. (Amended) ~~The head~~, as claimed in Claim 1 [2], wherein said read gap of said yoke is disposed at a first distance from said magnetic media and said magnetoresistive read element is disposed at a second distance from said magnetic media, said first distance being smaller than said second distance.

A3

The magnetic recording system

4. (Amended) ~~The head,~~ as claimed in Claim 1 [2], wherein said [magnetoresistive element produces a readback pulse having a] substantially Lorentzian[-type] pulse shape includes a peak near zero head position with respect to said one of said perpendicular magnetic polarity transitions.

The magnetic recording system

8. (Amended) ~~The head~~, as claimed in Claim 1, wherein said write element comprises first and second write poles, wherein said first and second write poles have first and second cross-sectional areas [widths], respectively, said second [first] cross-sectional area [width] being larger than said first [second] cross-sectional area [width].

A4

The magnetic recording system

9. (Amended) ~~The head~~, as claimed in Claim 8, wherein said second [first] cross-sectional area [width] is about 10 to 100 times larger than said first [second] cross-sectional area [width].

The magnetic recording system

10. (Amended) ~~The head~~, as claimed in Claim 1, wherein said yoke includes [further comprising: first, second and third pole pieces wherein said] first, second and third pole pieces [are] in a common plane with said read gap, said common plane being defined by masking during fabrication.

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17. (Amended) A magnetic storage device comprising:

a magnetic media having magnetic polarity transitions perpendicularly recorded thereon; [and]

a read element for reading said perpendicular magnetic polarity transitions, said read element including:

a flux guide [flux-guide] having a read gap, said read gap used for sensing said perpendicular magnetic polarity transitions and for producing a magnetic flux in said [flux-guide] flux guide in response to each of said perpendicular magnetic polarity transitions, and

a magnetoresistive element mounted in said flux guide for producing a readback pulse having a substantially Lorentzian pulse shape in response to said magnetic flux; and

circuitry adapted to receive a readback pulse having a substantially Lorentzian pulse shape from said magnetoresistive element.

18. (Amended) The magnetic storage device, as claimed in Claim 17, wherein said substantially Lorentzian pulse shape includes a peak near zero head position with respect to and in response to one of said perpendicular magnetic polarity transitions [read element further includes:

a magnetoresistive element mounted in said flux-guide for sensing said magnetic flux within said flux guide].

20. (Amended) The magnetic storage device, as claimed in Claim 17, wherein said circuitry includes [further comprising:]

means for filtering said [a] readback signal so that said readback signal has a greater resemblance to an ideal Lorentzian pulse shape [produced by said read element, wherein said means for filtering produces a signal having a substantially Lorentzian pulse-shape].

21. (Amended) The magnetic storage device, as claimed in Claim 17, further comprising:

a write element for writing said perpendicular magnetic polarity transitions on said magnetic media, said write element including:

first and second write poles having [a] first and second ends, respectively, said first and second ends located proximate to a surface of said magnetic media;

a coil element operatively coupled to said first and second write poles for writing to said magnetic media.

22. (Amended) The magnetic storage device, as claimed in Claim 21, wherein said first and second write poles comprise first and second cross-sectional <u>areas</u> [widths], respectively,

said <u>second</u> [first] cross-sectional <u>area</u> [width] being larger than said <u>first</u> [second] cross-sectional <u>area</u> [width].

23. (Amended) The magnetic storage device, as claimed in Claim 22, wherein said <u>second</u> [first] cross-sectional <u>area</u> [width] is about 10 to 100 times larger than said <u>first</u> [second] cross-sectional <u>area</u> [width].

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27. (Amended) The magnetic storage device, as claimed in Claim 17, wherein said <u>magnetic media is a rotating disk</u> [read element produces a readback pulse having a substantially Lorentzian pulse shape].

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29. (Amended) The magnetic storage device, as claimed in Claim 17, wherein said read element <u>floats above</u> [is in virtual contact with] said magnetic media <u>on a cushion of air during a read operation</u>.

Add the following claims:

30. A magnetic storage device comprising:

a magnetic storage media;

a head including a write element for inducing perpendicular magnetic polarity transitions in said magnetic storage media during a write operation, a yoke, and a magnetoresistive read element mounted in a flux flow path of said yoke and recessed from said magnetic storage media for producing readback pulses with substantially Lorentzian pulse shapes in response to and in one-to-one correspondence with said perpendicular magnetic polarity transitions during a read operation; and

circuitry adapted for receiving readback pulses with substantially Lorentzian pulse shapes from said magnetoresistive read element.

31. The magnetic storage device, as claimed in Claim 30, wherein said magnetoresistive read element is sufficiently recessed from said magnetic storage media to prevent thermal asperities in said magnetoresistive read element.

32. The magnetic storage device, as claimed in Claim 30, wherein said magnetoresistive read element is sufficiently recessed from said magnetic storage media to prevent electrostatic discharge between said magnetoresistive read element and said magnetic storage media.

33. The magnetic storage device, as claimed in Claim 30, wherein said magnetoresistive read element is sufficiently recessed from said magnetic storage media to prevent chemicals on said magnetic storage media from corroding said magnetoresistive read element.

34. The magnetic storage device, as claimed in Claim 30, wherein said circuitry includes a detector designed to detect Lorentzian pulse shapes.

35. The magnetic storage device, as claimed in Claim 30, wherein said detector is a class-4 partial response (PR4) detector.

36. The magnetic storage device, as claimed in Claim 30, wherein said detector is a peak detector.

37. The magnetic storage device, as claimed in Claim 30, wherein said detector receives said readback pulses.

38. The magnetic storage device, as claimed in Claim 30, wherein said circuitry includes a high pass filter that receives said readback pulses and provides filtered readback pulses, which more closely resemble ideal Lorentzian pulse shapes than said readback pulses, to said detector.

39. The magnetic storage device, as claimed in Claim 30, wherein said magnetic storage device is devoid of a high pass filter between said magnetoresistive read element and said detector.

40. The magnetic storage device, as claimed in Claim 30, wherein said magnetic storage device is devoid of a differentiator between said magnetoresistive read element and said detector.

41. The magnetic storage device, as claimed in Claim 30, wherein said magnetic storage device is devoid of signal processing circuitry between said magnetoresistive read element and said detector.

42. The magnetic storage device, as claimed in Claim 30, wherein said magnetic storage media includes a magnetic underlayer and a recording media such that the orientation of a magnetic easy axis is perpendicular to a top surface of said magnetic storage media.

43. The magnetic storage device, as claimed in Claim 30, wherein said readback pulses have peaks near zero head positions with respect to said perpendicular magnetic polarity transitions.

44. The magnetic storage device, as claimed in Claim 30, wherein said readback pulses are substantially symmetric about zero head positions with respect to said perpendicular magnetic polarity transitions.

45. The magnetic storage device, as claimed in Claim 30, wherein said readback pulses have peaks near and are substantially symmetric about zero head positions with respect to said perpendicular magnetic polarity transitions.

46. The magnetic storage device, as claimed in Claim 45, wherein said readback pulses have a single voltage polarity with respect to a baseline voltage between said readback pulses.

47. The magnetic storage device, as claimed in Claim 30, wherein said yoke includes a write flux guide that provides a write gap and a read flux guide that provides a read gap, and said read flux guide is integral with and positioned within said write flux guide.

48. The magnetic storage device, as claimed in Claim 47, wherein said yoke includes first, second and third pole pieces, said first and third pole pieces are in said write flux guide and provide write poles that define said write gap, and said first and second pole pieces are in said read flux guide and provide read poles that define said read gap.

49. The magnetic storage device, as claimed in Claim 48, wherein said first, second and third pole pieces are substantially aligned with one another and define a plane that is substantially parallel to a top surface of said magnetic storage media.

50. The magnetic storage device, as claimed in Claim 48, wherein said magnetoresistive read element connects said first and second pole pieces.

51. The magnetic storage device, as claimed in Claim 48, wherein said yoke includes a non-magnetic spacer in said write flux guide that prevents magnetic flux from circulating through said write flux guide during a read operation.

52. The magnetic storage device, as claimed in Claim 48, wherein said first, second and third pole pieces are part of an air bearing surface that floats above said magnetic storage media on a small cushion of air during read and write operations.

53. The magnetic storage device, as claimed in Claim 48, wherein said first, second and third pole pieces contact said magnetic storage media during read and write operations.

54. The magnetic storage device, as claimed in Claim 48, wherein said first, second and third pole pieces contact a lubricant on a top surface of said magnetic storage media during read and write operations.

55. The magnetic storage device, as claimed in Claim 48, wherein said head includes write coils disposed between said first and third pole pieces but not between said first and second pole pieces.

56. The magnetic storage device, as claimed in Claim 48, wherein said head includes write coils disposed between said first and second pole pieces.

57. The magnetic storage device, as claimed in Claim 30, wherein said yoke includes a write flux guide that defines a write gap and a read flux guide that defines a read gap and is separate from said write flux guide.

58. The magnetic storage device, as claimed in Claim 30, wherein said magnetoresistive read element is positioned within said write element.

59. The magnetic storage device, as claimed in Claim 30, wherein said magnetic storage device is a tape drive.

60. The magnetic storage device, as claimed in Claim 30, wherein said magnetic storage device is a disk drive.